

DAMASCENE PATTERNING OF BARRIER LAYER METAL FOR C4 SOLDER BUMPS

Abstract

A system and method for forming a novel C4 solder bump for BLM (Ball Limiting Metallurgy) includes a novel damascene technique is implemented to eliminate the Cu undercut problem and improve the C4 pitch. In the process, a barrier layer metal stack is deposited above a metal pad layer. A top layer of the barrier layer metals (e.g., Cu) is patterned by CMP. Only bottom layers of the barrier metal stack are patterned by a wet etching. The wet etch time for the Cu-based metals is greatly reduced resulting in a reduced undercut. This allows the pitch of the C4 solder bumps to be reduced. An alternate method includes use of multiple vias at the solder bump terminal.